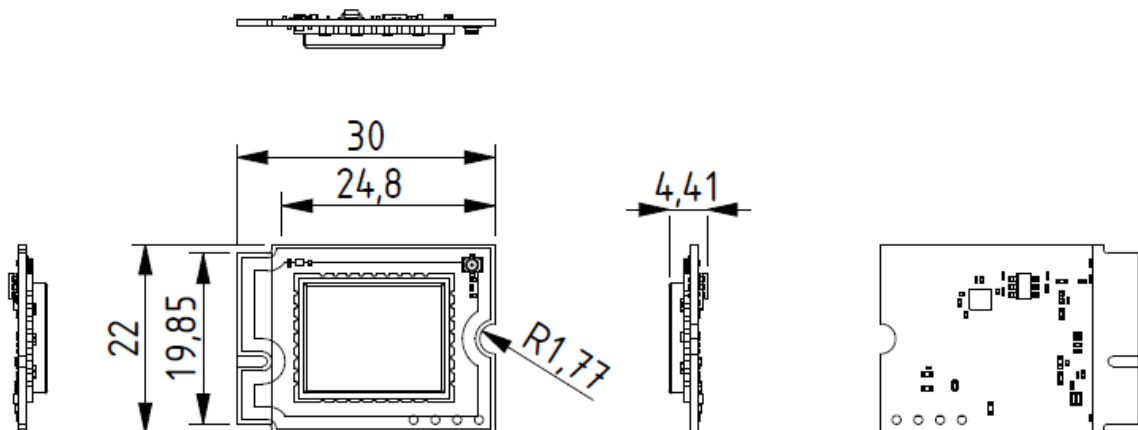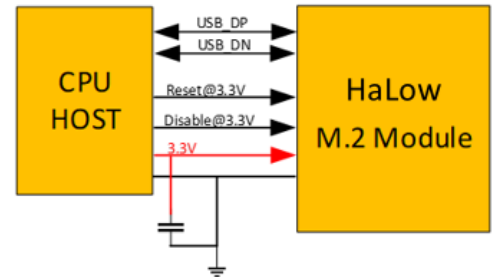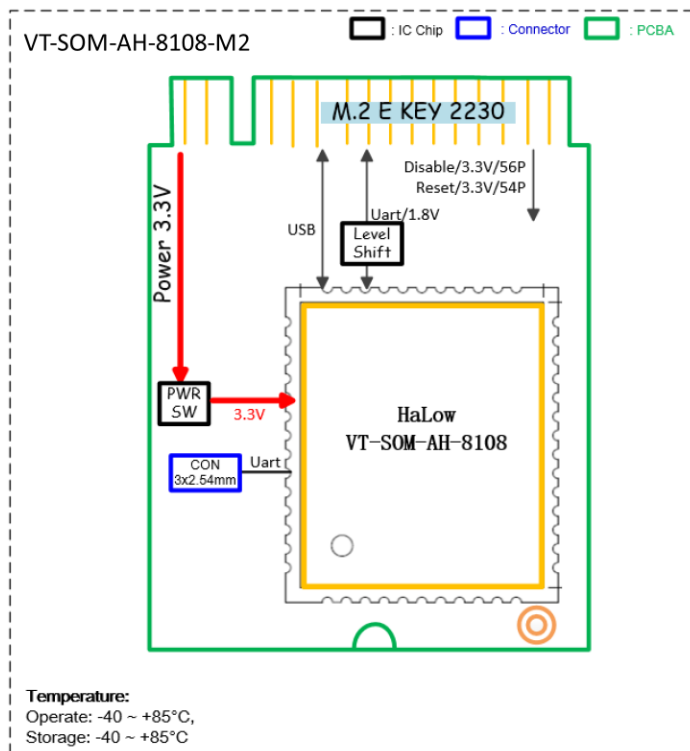# VT-SOM-AH-8108-M2 Wi-Fi HaLow Module

Product Brief

VT-SOM-AH-8108-M2 is a compact, ready-to-integrate Wi-Fi HaLow module in the M.2 (2230) form factor. It incorporates the Morse Micro MM8108 single-chip SoC, which fully integrates the radio, PHY, and MAC layers for IEEE 802.11ah compliance, enabling efficient sub-1GHz license-free operation at data rates up to 43.33Mbps. With its integrated RF front-end—including a power amplifier, low-noise amplifier, and transmit/receive switch—the module provides reliable, long-range connectivity with superior barrier penetration. When paired with an M.2-to-USB adapter, it offers a plug-and-play upgrade path, allowing you to easily transition from legacy RF solutions to a modern Wi-Fi HaLow connection secured with WPA3. This solution significantly reduces development time and complexity for new or upgraded IoT designs.

VT-SOM-AH-8108-M2 enables flexible network deployment and easy integration into devices and systems to adapt to diverse field conditions, making it ideal for IoT applications in smart cities, industrial monitoring, logistics tracking, fleet management and connected appliances.

Product Outlines

Block Diagram

VT-SOM-AH-8108-M2

□ : IC Chip □ : Connector □ : PCBA

M.2 E KEY 2230

Power 3.3V

Disable/3.3V/56P
Reset/3.3V/54P

USB

Uart/1.8V
Level Shift

PWR SW 3.3V

CON 3x2.54mm Uart

HaLow
VT-SOM-AH-8108

Temperature:
Operate: -40 ~ +85°C,
Storage: -40 ~ +85°C

CPU HOST

USB_DP
USB_DN
Reset@3.3V
Disable@3.3V
3.3V

HaLow
M.2 Module

Applications

- Home automation

  Alarm system, security cameras, smart doorbells

  Entertainment (media streaming adapters, speakers)

  Baby monitors

  Garage door openers

  Door locks

  Smart appliances

  Energy management

  Voice control frontends

  Consumer robotics

- Portables & Wearables

  Smart watches

  Health trackers

- Building automation

  Building access control & security

  HVAC & air quality control

  Smart city network

  Commercial robotics

  EV battery charger telemetry

- Retail & Logistics

  Digital signage

  Kiosks / POS / vending

  Fleet management

  Inventory management / scanners

- Industrial Automation

  Autonomous mobile robotics

Specifications

VT-SOM-AH-8108-M2					
System	Wi-Fi HaLow chip	Morse Micro MM8108 HaLow SoC			
	MCU	STM32 (786KB SRAM, 2MB flash memory)			
I/O	Host interface	1 x USB 2.0			
	UART	1 x UART			
	Antenna	1 x U.FL connector			
HaLow Features	Wi-Fi standard	IEEE 802. 11ah			
	Frequency range (Sub 1 GHz bands)	850MHz ~ 950MHz			
	Channel bandwidth	1 / 2 / 4 /8MHz			
	Data rate	1MHz	2MHz	4MHz	8MHz
		4.44Mbps (Max.)	8.67Mbps (Max.)	20Mbps (Max.)	43.33Mbps (Max.)
	Operating mode	Station			
	Security	AES encryption engine			
		SHA1 and SHA2 hash algorithms (SHA-256, SHA-384, SHA-512)			
		WPA3 including protected management frames (PMF)			
Software	Working mode	Standalone Mode (User application runs on the STM32 MCU inside the VT-SOM-AH-8108-M2)			
		Standalone Mode with AT command (External controller sends AT commands to the VT-SOM-AH-8108-M2)			
	SDK	Vantron IoT SDK			
Mechanical	Dimensions	30mm x 22mm x 4.41mm			
	Voltage	VCC: 3.3V			
	Temperature	Operating: -40℃~+85℃		Storage: -40℃~+85℃	
	Humidity	Less than 85% (Non-condensing)			

⬤▬ Pinout

BOTTOM SIDE		TOP SIDE	
74	3.3V	75	GND
72	3.3V	73	
70		71	
68		69	GND
66		67	
64		65	
62		63	GND
60		61	
58		59	
56	#Disable	57	GND
54	RESET_N	55	
52		53	
50		51	GND
48		49	
46		47	
44		45	GND
42		43	
40		41	
38		39	GND
36	UART_CTS	37	
34	UART_RTS	35	
32	UART_RX	33	GND
30	Key E	31	Key E
28	Key E	29	Key E
26	Key E	27	Key E
24	Key E	25	Key E
22	UART_TX	23	
20		21	
18	GND	19	
16		17	
14		15	
12		13	
10		11	
8		9	
6		7	GND
4	3.3V	5	USB_DN
2	3.3V	3	USB_DP
		1	GND

Ordering Information

Ordering No.	SoC	Main I/Os	Operating Temp.
VT-SOM-AH-8108-M2	Morse Micro MM8108	USB, UART, U.FL connector	-40℃ ~ +85℃
VT-SOM-AH-8108-M2-EVK	VT-SOM-AH-8108-M2 + M.2 to USB adapter		

Packing List	
VT-SOM-AH-8108-M2 Wi-Fi HaLow module	1
Wi-Fi HaLow antenna (for sample orders)	1

Optional Accessory	
M.2 to USB adapter	1

Assembly with an M.2 to USB Adapter

M.2 HaLow
module

M.2 to USB
adapter (Optional)

Assembled
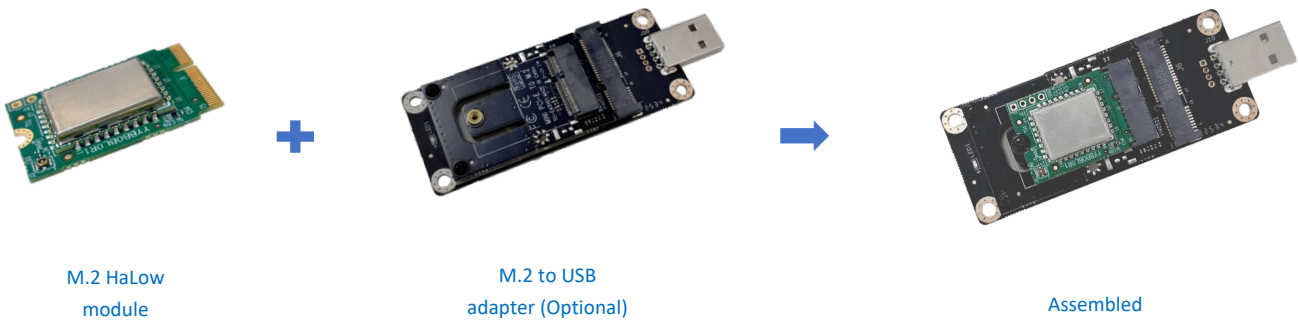
Company Profile

Since its establishment in 2002 by two Silicon Valley entrepreneurs, Vantron Technology has been at the forefront of the connected IoT devices and IoT platform solutions. Today, Vantron boasts a global customer base that includes several Fortune 500 companies. Its product lines cover edge intelligent hardware, IoT communication devices, industrial displays and BlueSphere cloud device management platforms.

With over 20 years of experience in R&D of embedded edge intelligent hardware, Vantron has provided users with diverse embedded solutions featuring ARM and X86 architectures. Its offerings range from Linux to Windows, from embedded to desktop level, and from gateway to server. In addition, it provides users with system clipping, driver transplantation and other related services.